

REMARKS

Claims 1, 2, 4-9, 11-14 and 21-24 are pending.

Claims 1, 8 and 21 are amended to recite the groove is shaped as a V, the sides of the groove [are] being between 75 and 105° apart and the line of weakness being formed within the arc of the V. The features are taken from Claim 2 and 9. In view of the amendment Claims 2 and 9 are cancelled.

I. 35 USC § 103(a)

Claims 1, 2, 4-9, and 11-24 stand rejected under 35 USC § 103(a) as allegedly being unpatentable over CA 910844. The Office Action asserts the reference teaches or suggests each feature of the claims.

The Office action states CA 910,844 does not disclose its angle but routine experiments would arrive at the presently claimed angle range of 75-105 degrees. In particular, the Office action asserts, even though CA 910,844 does not specifically disclose the angle of the V-groove, it does disclose the copper depositing in the form of dendrites that develop in directions normal to the dimensions of the groove.

CA 910,844, page 7, lines 12-17, discloses "The plane at which these dendrites meet in their growth is a plane of weakness at which the deposit can readily be broken."

CA '844, page 8, lines 26-27 discloses "the plane of weakness in the bottom edge deposit eliminates any serious interference with the stripping operation."

A. CA '844 is ambiguous

Applicants and the Examiner agree CA '844 does not disclose the angle of its V-groove. However, the Office action relies on the results quoted from pages 7 and 8 of CA '844 and assumes the angles of the V-groove of CA '844 must be within the range set forth by the present invention for the copper sheets and has a line of weakness within the V-groove. This allegedly results because CA '844 discloses a plane of weakness in the bottom edge deposit and, even though it does not disclose the angle to achieve this, one skilled in the art would figure out this angle with routine experimentation.

Page 7 of CA '844 discloses:

"Furthermore, the V-groove 18 at the bottom edge of the cathode blank 10 causes the copper to deposit at this edge in the form of dendrites which develop in directions normal to the sides of the V-groove. The plane at which these dendrites meet in their growth is a plane of weakness at which the deposit can readily be broken."

The Office action also relies on the disclosure at page 8, lines 26-27 as grounds for assuming the plane of weakness is within the V-groove to get equal splitting of deposited material rather than at the edge of the V-groove:

"the plane of weakness in the bottom edge deposit eliminates any serious interference with the stripping operation".

From this the Office action at page 3 concludes:

"Therefore, the area of the V-groove is partially filled with copper material as in the instant invention and the center of the V-groove where the plane of weakness forms in the CA patent, is the same as the line of weakness as set forth in the instant invention. Therefore, the CA patent even though it does not disclose the specific angles of the V-groove, does recognize that the V-groove must be partially filled with material and must also form a line of weakness to separate the copper sheets from the cathode plate."

MPEP 2121.01 states "Even if a reference discloses an inoperative device, it is prior art for all that it teaches." *Beckman Instruments v. LKB Produkter AB*, 892 F.2d 1547, 1551, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989). Therefore, "a non-enabling reference may qualify as prior art for the purpose of determining obviousness under 35 U.S.C. 103." *Symbol Techs. Inc. v. Opticon Inc.*, 935 F.2d 1569, 1578, 19 USPQ2d 1241, 1247 (Fed. Cir. 1991)." In *Symbol*, the non-enabling reference was to be considered in combination with other references and the patent was *not* found invalid.

Applicants respectfully submit CA '844 discloses ambiguous results which are not necessarily those of the present invention. As mentioned above, the reference is only prior

art for all that it teaches. CA '844 does not teach enough details to determine: (1) how to achieve the results quoted from pages 7 and 8 or (2) if its results are the same as those of the present invention. Thus, it does not necessarily lead to the same range.

CA '844, page 6 discloses to run at least 100 hours sufficient to obtain a deposit thickness of at least 1/8 inch of copper on each side of the blanks, e.g., a deposit of at least 5 pounds per square foot of surface area on each cathode. CA '844, page 7 discloses the reusable cathode blank is made of relatively heavy gauge material having a thickness of about 0.1 inch to about 0.3 inch, e.g., about 0.125 inch. Page 7 also discloses this is in contrast with a typical cathode starting sheet which has a thickness of only 0.026 inch or less. CA '844, page 12 describes an example wherein about a 5/16th inch thick deposit of copper was deposited.

However, it is respectfully submitted this is insufficient information for an assumption that CA '844 runs its device until the entire V-groove is filled or partially filled with copper material in the same manner as in the instant invention. Also, out of the options for partially filling, there is no teaching of whether this would be due to having a gas space, a liquid space, or having only a thin layer in the V-groove.

The disclosure at page 8, lines 26-27 "the plane of weakness in the bottom edge deposit eliminates any serious interference with the stripping operation" is not enough to be certain that the plane of weakness is down the center of the V-groove as assumed in the Office action. The edge is the entire edge. Thus, the plane of weakness could be at the edge of the V-groove rather than down the center of the V-groove. Moreover, CA '844 does not disclose that a line of weakness at the edge of the V-groove would be a problem. The Office action is impermissibly using applicant's own disclosure at page 6 that, "If the line of weakness is not formed within the groove, the fracture line may be initiated outside the confines of the groove ...." Having such a line of fracture outside the frangible region creates difficulties in the stripping process."

B. The 30 March 2007 Declaration of Inventor Revill Wayne Armstrong

Page 9 of the present application explains the angle of the present invention is selected to preferably allow deposition of copper in the V-groove adjacent the apex with the

line of weakness extending between the arc of the V-groove; the specification teaches examples of suitable angles. Page 9 further explains Applicants found certain groove sizes and shapes permit symmetrical splitting of the deposited metal, whereas others do not.

Applicants provide a groove having an arc of 90 degrees plus-or-minus 15 degrees and a suitable depth for the inventive purpose, *i.e.* the symmetrical splitting of the deposited metal. The bottom of p.8 explains the copper crystals are deposited at right angles. Thus, selecting a proper V-groove angle causes the crystals to form without filling adjacent the apex of the V-groove with copper.

The Office action asserts 50 degrees tested against in the 30 March 2007 Declaration of Revill Wayne Armstrong (hereinafter the "Armstrong Declaration") was not a good angle to compare against because the CA '844 drawings are not to scale so Applicants cannot take the angle shown in the drawing (about 50 degrees) as literal. However, Applicants submit it is the only angle expressly disclosed. It would be improper for applicant to assume CA '844 inherently discloses an angle within the present range and then compare itself to it. Applicants do not have to create or assume a "prior art selection" where it plainly does not exist. "Although evidence of unexpected results must compare the claimed invention with the closest prior art, applicant is not required to compare the claimed invention with subject matter that does not exist in the prior art." MPEP 716.02(f)(III).

Moreover, the data is still relevant for showing the criticality of the claimed range or at least the preferred 90 degrees.

Paragraph 8 of the Armstrong Declaration explains the claimed 75-105 degree span was determined on the basis of "the need for the span of the V-groove to be large enough for copper to be deposited in the groove and thereby produce fracture or crack initiation within the groove (as opposed to on the outside of the groove), but not so large that it completely fills with deposited materials to such an extent that the material cannot be released cleanly". The Armstrong Declaration shows, if a 50 degree angle outside the present claimed range is used then insufficient copper is deposited within the narrow V-groove and the preferential failure point is at the thinnest point, *i.e.* the two outside edges, since no line of weakness is formed within the arc of V-groove.

These preferential failure points are shown in Figure 3 of the subject specification. As explained in paragraph 9 of the Armstrong Declaration, "the approximate 50 degree span of the prior art in CA 910,844, as shown in Figure 3 thereof, does not provide for clean release of the deposited metal from the cathode". Indeed, the Armstrong Declaration specifically refers to this problem and the balance between the V-groove being large enough for copper to be deposited in the groove but not so large that it completely fills with the deposited material.

The Armstrong Declaration also discusses the poor results obtained with a narrow V-groove as shown the CA'844 and the lip or hook formed along almost the entire portion of the deposited metal. This lip or hook is both unsightly and dangerous as it gives uneven weight distribution to the respective sides of the deposited metal and causes transport problems as the hook tends to foul edges of other metal plates, etc.

Thus, Applicants again state the Armstrong Declaration discusses the criticality of the angle of the V-groove which in no way does CA 910,844 teach or suggest.

C. The plane of weakness of CA '844 is not necessarily down the middle of the V-groove

Amended claims 1, 8 and 21 all now recite that the groove is V-shaped, the sides of the groove are between 75 and 105° apart, and the line of weakness is formed within the arc of the groove. There is no teaching or suggestion of such features in CA '844. As shown by the present application at Figure 3 (labeled "Prior Art") the angle of the V-groove determines the location of the line of weakness. Thus, it cannot be said that such a feature is inherent, *i.e.* necessarily present, or obvious in CA '844.

The inventors of CA '844 may have arrived at an angle other than that presently claimed and missed the improved results of the present invention.

Applicant respectfully traverses the Office action assertion that the "plane of weakness" of CA '844 is down the center of the V-groove. Claim 3 of CA '844, defines the "inverted V-shaped groove in the bottom peripheral edge" and then further states the plane of weakness is formed in the copper "deposited at this edge". The plane of weakness is not necessarily down the center of the V-groove. For example, with a narrow 50° V-groove

insufficient copper is deposited within the V-groove. Thus, the preferential failure point is at the thinnest deposit, *i.e.* the two outside edges of the V-groove. Thus, the CA '844 plane of weakness may be at the peripheral edge of the cathode blank as shown in Figure 3 (labeled "Prior Art") of the present application. This is consistent with the experimental and testing data obtained by the Applicant and listed in the Armstrong Declaration.

D. Dependent Claims Further Distinguish Over CA '844

The obviousness rejection on the basis of CA '844 also extends to all pending dependent claims. Applicants respectfully traverse such a rejection on the following bases:

Claims 2 and 9 have now been incorporated into claims 1 and 8.

Claims 4 and 11 recite "...the sides of the groove are 90 degrees apart." There is no teaching or suggestion of such a feature in CA '844. It is submitted this is further commensurate in scope with the Armstrong Declaration. Thus, the Applicants respectfully submit claims 4 and 11 further distinguish over CA '844.

Claims 5 and 12 recite "...wherein the groove is shaped to allow deposition of metal directly adjacent the apex of the groove". Although CA '844 teaches the deposition occurs "in directions normal to the sides of the V-groove" (at p.7, ll.4-15), it is not necessarily so, *i.e.* inherent, that the deposition occurs "directly adjacent to the apex of the groove". As shown by Figure 3 of the present application, depending upon the angle of the V-groove, such a feature may be impossible. Accordingly, the Applicants respectfully submit claims 5 and 12 further distinguish over CA '844.

Claims 6 and 13 recite "...the groove is shaped to permit deposited metal to substantially fill the entire groove". CA '844 neither teaches nor suggests this. As discussed above, if the angle of the V-groove shown by Figure 3 in CA '844 of approximately 50 degrees were employed, such a feature may be impossible because the relatively narrow groove does not permit electrodeposition of metal therein and the frangible portion forms about the periphery. Accordingly, Applicants respectfully submit claims 6 and 13 are inventive over CA '844.

Moreover, present claims 7, 14 and 21 recite trapping gas in the groove. CA '944 does not disclose this.

Claims 7 and 14 recite "...wherein the groove is shaped to capture gas rising from below the cathode plate during deposition of metal". Again, there is no teaching or suggestion of such a feature in CA '844. As shown in Figures 3-6 of the present application, the angle of the V-groove determines the location of the line of weakness. Thus, it cannot be said that such a feature is inherent, i.e. necessarily present, in CA '844. Thus, the Applicants respectfully submit claims 7 and 14 are inventive over CA '844.

Claim recites, *inter alia*, "...trapping a gaseous material in the V-groove... to define [the location of the frangible portion]". By directing the location of the trapped gas, the location of the frangible portion where the deposited metal will fracture can be more accurately controlled. This permits more reliability in the symmetrical nature of the resulting sheets. As CA '844 neither teaches nor suggests such a step, Applicant respectfully submits claims 21 to 24 are also inventive over CA '844.

### III. Conclusion

In view of the above, it is respectfully submitted the present claims are neither taught nor suggested by the cited references and the present invention is novel and inventive over the cited document. A Notice of Allowance is respectfully requested.

If any fee is necessary to make this paper, or any paper filed herewith, timely and/or complete, such fee may be deducted from deposit account number 19-4375.

Respectfully submitted,

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